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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**APPEAL FROM THE EXAMINER TO THE  
BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:                      Vibhu K. Kalyan  
Serial No.:                                      09/195,332  
Filing Date:                                  November 18, 1998  
Group Art Unit:                                2764  
Examiner:                                      Vincent Millin  
Title:    *COMPUTER-IMPLEMENTED PRODUCT  
VALUATION TOOL*

Honorable Assistant Commissioner  
for Patents  
BOARD OF APPEALS AND INTERFERENCES  
Washington, D.C.      20231

Dear Sir:

**APPEAL BRIEF**

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Appellant ~~has~~ appealed to this Board from the decision of the Examiner, contained in a final Office Action mailed August 2, 2000, finally rejecting Claims 1-19. Appellant mailed a Notice of Appeal on November 2, 2000. Appellant respectfully submits this Appeal Brief, in triplicate, along with the statutory fee of \$310.00 under 37 C.F.R. § 1.17(c).

**REAL PARTY IN INTEREST**

The real party in interest for this Application under appeal is i2 Technologies, Inc.

**RELATED APPEALS AND INTERFERENCES**

There are no other appeals or interferences known to the Appellant, the undersigned Attorney for Appellant, or the Assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**STATUS OF CLAIMS**

Claims 1-19 were rejected in the final Office Action mailed August 2, 2000. Claims 1-19 are all presented for appeal and are set forth in the Appendix hereto.

**STATUS OF AMENDMENTS**

All amendments submitted by Appellant were entered by the Examiner before the issuance of the final Office Action mailed August 2, 2000.

**SUMMARY OF INVENTION**

According to one embodiment of the present invention, a computer-implemented method of valuing products includes assigning a price to each of a number of products, each product including one or more product components, and assigning a demand probability value to each product. (Page 6, Line 17 - Page 8, Line 7) The method further includes calculating a component value for each component by performing the following steps: (a) assuming a beginning value for each component; (b) for a first component, calculating prorated values, such that for each product using that component, a prorated value is calculated on that component by calculating the difference between the product price and a value of the product's other components; (c) calculating a component value as a function of the prorated values and the probability values; (d) repeating steps (b) and (c) for all other components; (e) determining whether the component values converge; and (f) if any component value does not converge, using the calculated component value as the beginning component value and repeating steps (b) through (e) for that component. (Page 8, Line 8 - Page 10, Line 28) In addition, the method includes calculating a value for each product by summing the component values of all components of that product. (Page 8, Lines 8-17)

According to another embodiment of the present invention, a computer-implemented method of pricing an order for a product based on varying lead times during a specified time period includes calculating a set of values for a product over a range of available supplies of the product. (Page 16, Line 28 - Page 17, Line 12). The method also includes determining a size  $Q$  of the order and selecting a set of order points during a time horizon, each order point having a lead time  $LT$  to the next order point. Furthermore, the method includes calculating an incremental production quantity as  $Q/LT$  for each order point and calculating revenue displaced by the incremental production quantity for each order point using the product values. (Page 17, Line 13 - Page 19, Line 4). The method also includes calculating an average displaced revenue and calculating the price for the order using the average displaced revenue. (Page 19, Lines 4-5)

According to yet another embodiment of the present invention, a computer-implemented method of pricing make-to-order products includes assigning a demand probability value to each of a number of products, each product having an associated delivery time and price. (Page 23, Lines 12-34) The method also includes calculating an expected revenue from the products for at least two available capacities, the expected revenue being a function of the demand probability values and the prices. Furthermore, the method includes calculating an asking price for each of the products as the difference between its expected revenue from successive available capacities. (Page 23, Line 35 - Page 24, Line 32; Page 25 Lines 11-35)

### **ISSUE**

Whether Claims 1-19 are directed to statutory subject matter pursuant to 35 U.S.C. § 101.

### **GROUPING OF CLAIMS**

Pursuant to 37 C.F.R. § 1.192(c)(7), Appellant requests that the following claims be grouped together for purposes of this appeal:

1. Group 1 - Claims 1-15. Claims 1-15 may be deemed to stand or fall together for purposes of this appeal.

2. Group 2 - Claims 16-19. Claims 16-19 are directed to software embodied in a computer-readable medium and are in a format that has been specifically deemed statutory subject matter in *In re Beauregard*. Therefore, Claims 16-19 recite statutory subject matter whether or not Claims 1-15 recite statutory subject matter. Claims 16-19 may be deemed to stand or fall together for purposes of this appeal.

### **ARGUMENT**

The Examiner rejected Claims 1-19 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Specifically, the Examiner asserted that the invention “does merely manipulate an abstract idea and solve a purely mathematical problem without limitation to a practical application in the technological arts.” Claims 1-19 are all presented for appeal.

### **Claims 1-19 recite statutory subject matter according to the M.P.E.P. and *State Street***

The Examination Guidelines for Computer-Related Inventions included in the Manual of Patent Examining Procedure state that a process claim is statutory if the process is limited to a practical application of an abstract idea or mathematical algorithm in the technological arts. *M.P.E.P.* § 2106(IV)(B)(2)(b)(ii). A claim is limited to a practical application when the method recites a step or act of producing a concrete, tangible and useful result. *Id.* Similarly, in *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 149 F.3d 1368 (Fed. Cir. 1998), the Federal Circuit held that even purely mathematical algorithms are patentable if they are applied in a useful way.

In *State Street*, the Federal Circuit stated that “Unpatentable mathematical algorithms are identifiable by showing they are merely abstract ideas constituting disembodied concepts or truths that are not ‘useful’.” *Id.* at 1373. “To be patentable, an algorithm must be applied in a ‘useful’ way.” *Id.* Furthermore, the Federal Circuit noted: “the mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, would not render it nonstatutory subject matter, unless, of course, its operation does not produce a ‘useful, concrete and tangible result.’” *Id.* The court in *State*

*Street* went on to hold that “the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm . . . because it produces a ‘useful, concrete and tangible result’ – a final share price momentarily fixed . . .” *Id.*

A. Claims 1-19 apply mathematical algorithms to produce useful, concrete and tangible results

Applicant respectfully submits that Claims 1-19, like the claims held to be statutory in *State Street*, recite the practical application of mathematical algorithms to produce useful, concrete, and tangible results. For example, independent Claims 1 and 16 recite the transformation of product price and product demand probability values into values of products. Determining the values of products is certainly a useful, concrete and tangible result. Independent Claim 6 recites the transformation of a set of product values over a range of available supplies of the product, a size of an order for the product, and a lead time associated with the order into a price for the product order. Determining the price for a product order is also a useful, concrete and tangible result. Independent Claim 11 recites the transformation of product demand probability values and expected revenues from products into an asking price for each of the products. Again, determining an asking price for products is certainly a useful, concrete and tangible result. The product value, order price, and asking price determined in Claims 1 and 16, 6, and 11, respectively, are at least as useful, concrete and tangible as the share price determined in the claims of *State Street*. For at least these reasons, Applicant respectfully submits that independent Claims 1, 6, 11, and 16, and all claims depending from these independent claims, recite statutory subject matter.

B. Claims 16-19 specifically recite a tangible medium

In addition, as to Claims 16-19, Applicant respectfully directs the Board’s attention to the Federal Circuit decision of *In re Beauregard*, 53 F.3d 1583 (Fed. Cir. 1995), in which the Commissioner of the United States Patent and Trademark Office is quoted as stating, “Computer programs embodied in a tangible medium, such as floppy diskettes, are patentable subject matter under 35 U.S.C. § 101 and *must* be examined under 35 U.S.C. §§ 102 and 103.” *Id.* at 1584 (emphasis added). Claims 16-19 recite valuation software embodied in a

computer-readable medium and thus are also statutory for at least this reason (in addition to their recitation of a useful, concrete and tangible result as demonstrated above).

**CONCLUSION**

Appellant has demonstrated that the present invention, as claimed in Claims 1-19, is directed to statutory subject matter. Accordingly, Appellant respectfully requests that the Board reverse the final rejection of the Examiner and instruct the Examiner to issue a Notice of Allowance of Claims 1-19.

Enclosed is the statutory fee of \$310.00. Although no other fee is believed due, the Commission is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 02-0384 of Baker Botts L.L.P.

Respectfully submitted,

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**APPENDIX — CLAIMS PRESENTED ON APPEAL**

1. A computer-implemented method of valuing products, comprising:  
assigning a price to each of a plurality of products, each product comprising one or more product components;  
assigning a demand probability value to each product;  
calculating a component value for each component by performing the following steps:
  - (a) assuming a beginning value for each component;
  - (b) for a first component, calculating prorated values, such that for each product using that component, a prorated value is calculated on that component by calculating the difference between the product price and a value of the product's other components;
  - (c) calculating a component value as a function of the prorated values and the probability values;
  - (d) repeating steps (b) and (c) for all other components;
  - (e) determining whether the component values converge; and
  - (f) if any component value does not converge, using the calculated component value as the beginning component value and repeating steps (b) through (e) for that component; andcalculating a value for each product, based on the results of the preceding step, by summing the component values of all components of that product.
2. The method of Claim 1, wherein step (c) is performed by multiplying probability values by prorated values.
3. The method of Claim 1, wherein step (c) is performed by obtaining a sum of products of probability values and prorated values.
4. The method of Claim 1, wherein the probability values include both the probability of demand for a product and the probability that demand will arrive in a certain order relative to other products.



5. The method of Claim 1, wherein the method is performed to value non-standard products and assigning prices to products is performed by assigning prices of standard products.

6. A computer-implemented method of pricing an order for a product based on varying lead times during a specified time period, comprising:

calculating a set of values for a product over a range of available supplies of the product;

determining a size  $Q$  of the order;

selecting a set of order points during a time horizon, each order point having a lead time  $LT$  to the next order point;

for a first order point, calculating an incremental production quantity as  $Q/LT$ , and calculating revenue displaced by the incremental production quantity using the product values;

repeating the preceding step for each other order point;

calculating an average displaced revenue; and

calculating the price for the order, using the results of the preceding step.

7. The method of Claim 6, wherein:

the product has multiple components; and

the method further comprises repeating all steps for each component and summing the results.

8. The method of Claim 7, wherein calculating the price for the order comprises:

(a) assuming a beginning value for each component;

(b) for a first component, calculating prorated values, such that for each product using that component, a prorated value is calculated on that component by calculating the difference between the product price and a value of the product's other components;

(c) calculating a component value as a function of the prorated values and the probability values;

(d) repeating steps (b) and (c) for all other components;

(e) determining whether the component values converge;

(f) if any component value does not converge, using the calculated component value as the beginning component value and repeating said steps (b) through (e) for that component; and

(g) summing the values of all the components.

9. The method of Claim 6, wherein the displaced revenue is calculated by integrating a curve representing the set of product values.

10. The method of Claim 6, wherein the displaced revenue is calculated as the difference between a total potential revenue, determined from the product values for all available supplies S, and the total potential revenue for S - Q.

11. A computer-implemented method of pricing make-to-order products, comprising:

assigning a demand probability value to each of a plurality of products, each product having an associated delivery time and price;

calculating an expected revenue from the products for at least two available capacities, the expected revenue being a function of the demand probability values and the prices; and

calculating an asking price for each of the products as the difference between its expected revenue from successive available capacities.

12. The method of Claim 11, wherein the expected revenue is calculated as a sum of products of the probability values and the prices.

13. The method of Claim 11, wherein the expected revenue is calculated from a binary tree representing the probability values and the prices.

14. The method of Claim 11, wherein the expected revenue is calculated for each product in response to a product control policy.

15. The method of Claim 11, further comprising comparing the asking price for different products at a given capacity.

16. Valuation software for valuing manufactured products embodied in a computer-readable medium and operable to perform the following steps:

assigning a price to each of a plurality of products, each product comprising one or more product components;

assigning a demand probability value to each product;

calculating a component value for each component by performing the following steps:

(a) assuming a beginning value for each component;

(b) for a first component, calculating prorated values, such that for each product using that component, a prorated value is calculated on that component by calculating the difference between the product price and a value of the product's other components;

(c) calculating a component value as a function of the prorated values and the probability values;

(d) repeating steps (b) and (c) for all other components;

(e) determining whether the component values converge;

(f) if any component value does not converge, using the calculated component value as the beginning component value and repeating steps (b) through (e) for that component; and

calculating a value for each product, based on the results of the preceding step, by summing the component values of all components of that product.

17. The valuation software of Claim 16, wherein each product has an associated lead time and wherein calculating a value for each product further comprises using the lead time values and the component values to determine product values.

18. The valuation software of Claim 16, wherein each product has an associated delivery time and wherein calculating a value for each product comprises using the delivery time values and the component values to determine product values.

19. The valuation software of Claim 16, further operable to use the product values to determine whether to accept orders for products.